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Three new taxa of the genus *Melittia* Hübner, [1819] (Lepidoptera, Sesiidae) from India

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Abstract Three new species, *Melittia afonini* sp. nov., *M. suzukii* sp. nov. and *M. nilgiriensis* sp. nov., from India are described and figured.

Key words Taxonomy, Lepidoptera, Sesiidae, *Melittia*, *Melittia eurytion* (Westwood, 1848), *Melittia afonini* sp. nov., *Melittia suzukii* sp. nov., *Melittia nilgiriensis* sp. nov., Oriental region, India.

The present paper is based on a few specimens of clearwing moths of the genus *Melittia* Hübner, [1819] (Lepidoptera, Sesiidae) collected in India by our friends. We have received as a donation four species of this highly interesting genus. One of them, *M. eurytion* (Westwood, 1848), is a rather well-known and widely distributed species in the Oriental region. The remaining three species appear new to science and are described here.

The types of these new species are deposited in the following collections abbreviated in the text as follows: COGM—collection of Institute for Problems of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia; ZMUN—Zoological Laboratory, Meijo University, Nagoya, Japan.

Melittia eurytion (Westwood)

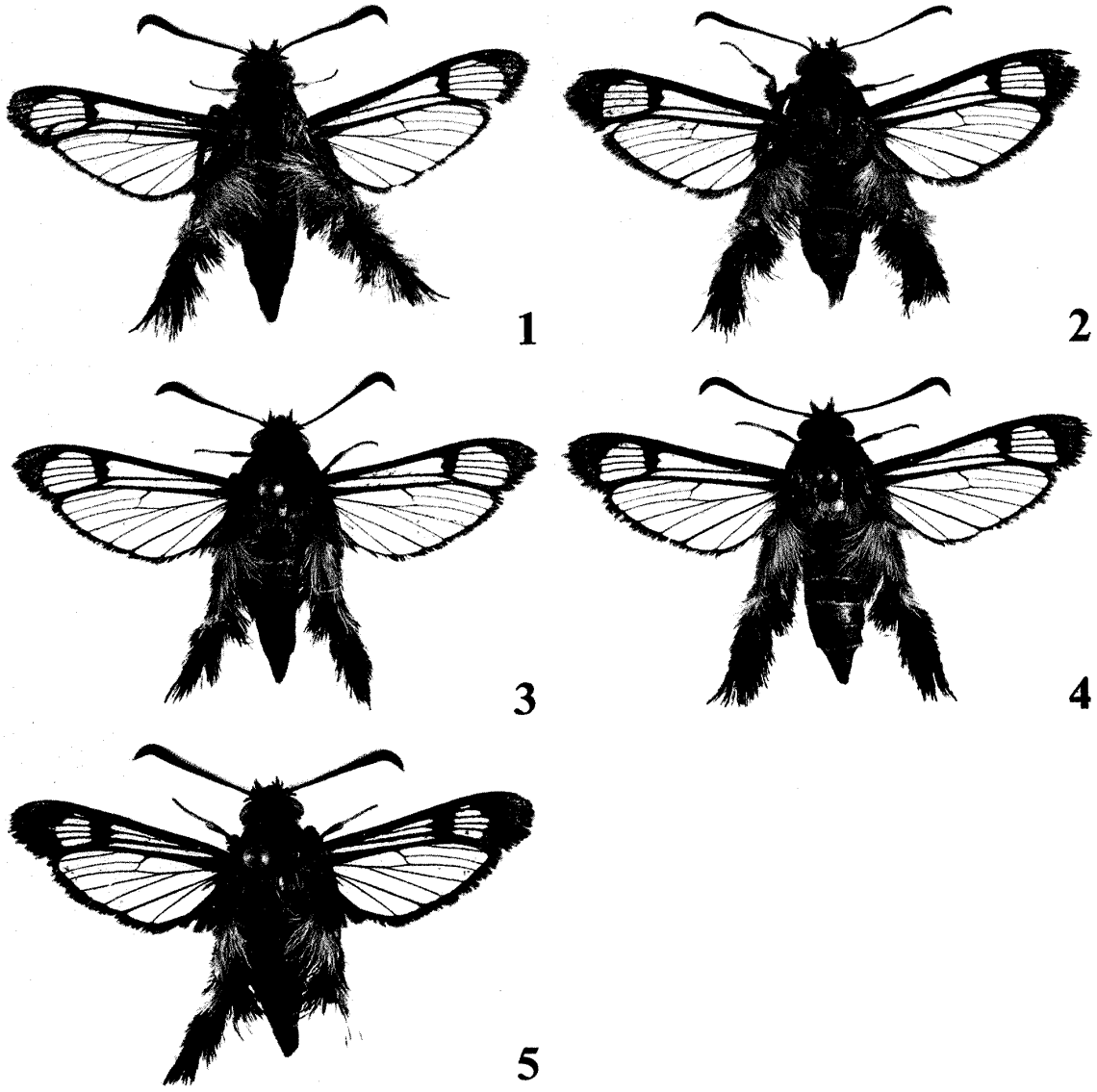
Trochilium eurytion Westwood, 1848: 62, pl. 30, fig. 5. Type locality: "India, Sylhet" [=NE. Bangladesh, Sylhet]. Lectotype ♀, in BMNH (fixed by Spatenka, 1992).

Melittia eutytion: Hampson, [1893]: 203, fig. 131; Le Cerf, 1916: 8, pl. 373, figs 3114-3115; Le Cerf, 1917: 146, fig. 4; Hampson, 1919: 92; Dalla Torre & Strand, 1925: 143; Gaede, 1933: 790, pl. 95, row f; Diakonoff, [1968]: 233, figs 726-727; Arita & Gorbunov, 1995*a*: 196, figs 830, 835, 838, pl. 108, figs 20-21; Gorbunov & Arita, 1996: 332, figs 7-8, 13-14; Arita & Gorbunov, 1996*a*: 158, figs 1-3, 9, 11-12; Gorbunov & Arita, *in litt*.

Bionomics. Exact host plant is as yet unknown, but it seems to belong to the genus *Trichosanthes* (Cucurbitaceae). In India the imagines were attracted by UV-light.

Distribution. This species has been reported from West and South China, Nepal, West, Northeast and East India, Bangladesh, Sri Lanka, Myanmar [=Burma], Thailand, Vietnam, the Philippines.

Material examined. 21 ♂, NE India, Assam, Nameri Nat. Park, 60 km N of Tezpur, 150 m, 27°20′N, 93°15′E, 24. VII-2. VIII. 1997, Y. Afonin & V. Siniaev leg. (COGM, ZMUN).



Figs 1–5. *Melittia* spp. 1. *M. afonini* sp. nov., ♂, holotype. Alar expanse 27.1 mm (COGM). 2. *Ditto*, ♀, paratype. Alar expanse 28.5 mm (COGM). 3. *M. suzukii* sp. nov., ♂, holotype. Alar expanse 27.8 mm (ZMUN). 4. *Ditto*, ♀, paratype. Alar expanse 32.8 mm (ZMUN). 5. *M. nilgiriensis* sp. nov., ♂, holotype. Alar expanse 29. 5 mm (ZMUN).

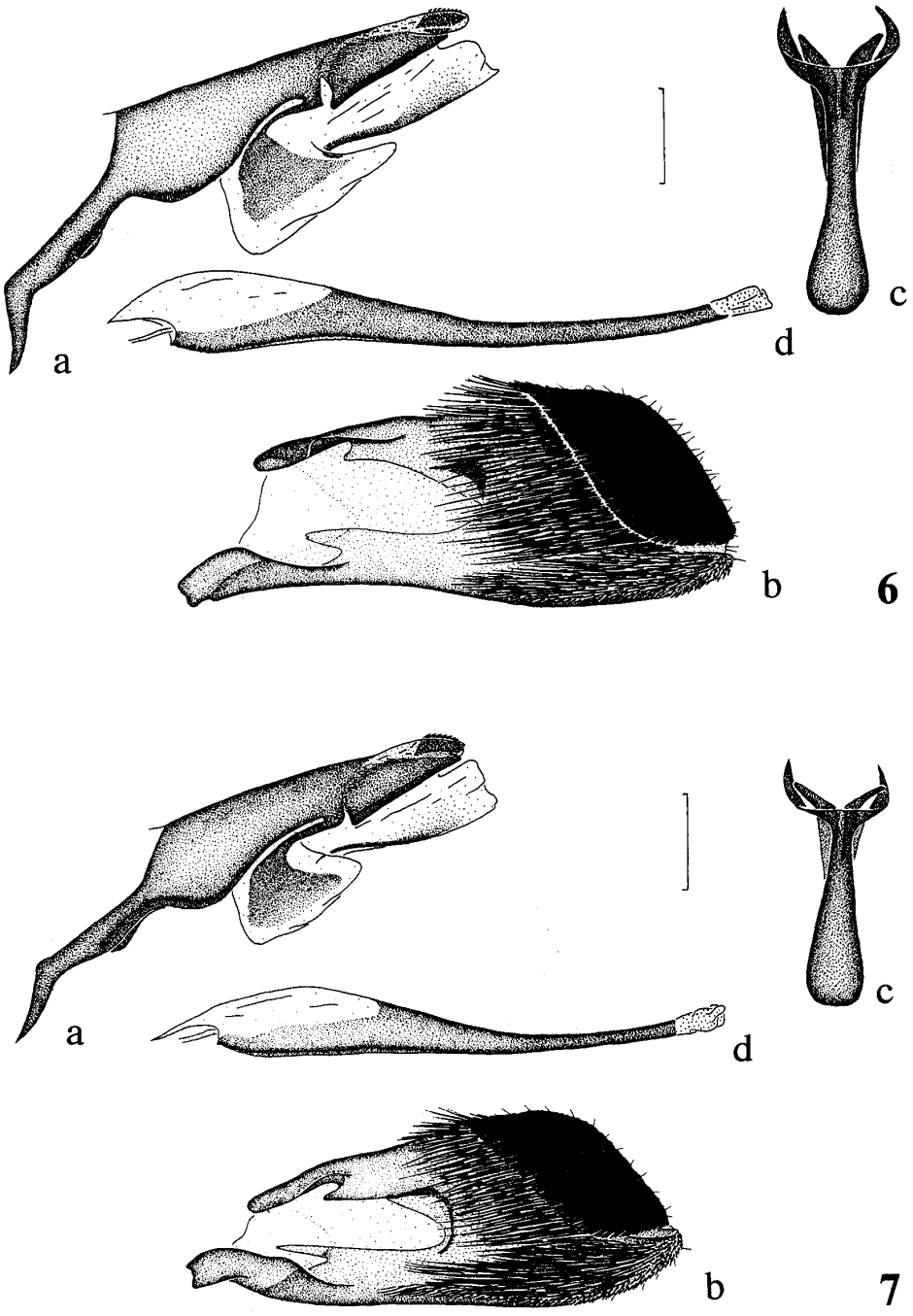
***Melittia afonini* sp. nov.** (Figs 1–2, 6a–d, 10, 12)

Description. Male (holotype) (Fig. 1). Alar expanse 27.1 mm; body length 14.6 mm; forewing 11.8 mm; antenna 6.4 mm.

Head: antenna dorsally dark brown to black with dark purple sheen, with admixture of individual snow-white scales at anterior margin; ventrally light brown, densely mixed with yellow scales; scapus dark gray-brown dorsally and white ventrally; frons dark gray-brown with bronzed-purple sheen, with a narrow white stripe laterally; basal joint of labial palpus with a few black hair-like scales externally; mid joint dorsally dark gray-brown, ventrally white with two narrow dark brown to black stripes externally and internally; apical joint dark gray-brown with purple sheen, with a narrow white stripe ventrally; vertex dark brown

to black with purple sheen, with a small white spot between ocelli and with a few white scales slightly anteriorly of ocellus, densely covered with hair-like black, white and pale yellow scales; occipital fringe dorsally black with admixture of white setaceous scales, laterally entirely white. Thorax: patagium dark brown with purple sheen, with a small white spot laterally; tegula dark brown to black with purple-bronzed sheen, with dirty yellow hair-like scales distally; mesothorax dark brown to black with bronzed-purple sheen; metathorax dark brown to black with bronzed-purple sheen, with a few dirty yellow scales laterally, and with a tuft of dirty yellow hair-like scales laterally; thorax laterally dark gray-brown with strong bronzed-purple sheen, with a few ocherous to whitish scales; posteriorly metaepimeron and metameron gray-brown with purple sheen, densely covered with white, long, hair-like scales. Legs: neck plate white with a few dark brown to black scales medially; fore coxa white with a few black hair-like scales basally and with a rather broad dark brown stripe with bronzed-green sheen exterior-subdistally; fore femur internally dark gray-brown with bronzed-green sheen, with admixture of individual white scales; externally white with a few dark gray-brown scales with purple-bronzed sheen; fore tibia ventrally yellow, dorsally dark brown with dark bronzed-green sheen with white posterior margin; fore tarsus ventrally yellow to pale yellow, dorsally narrowly dark brown to black with dark purple sheen; mid coxa white with purple hue, with admixture of gray-brown scales with bronzed-green sheen medially; mid femur internally pale yellow to white; externally dark brown with bronzed-green sheen, with a narrow pale yellow to white anterior margin and with ocherous to whitish hair-like scales at posterior margin; mid tibia internally pale yellow; externally dark brown with purple-bronzed sheen, with a few white scales with purple hue medially and a small white spot somewhat basally of base of spurs exterior-ventrally, and with a few white scales dorso-distally; spurs dark brown with purple-green sheen; mid tarsus exterior-dorsally dark brown with bronzed-purple sheen; interior-ventrally basal tarsomere white to ocherous with golden hue, remaining tarsomeres yellow to pale yellow with admixture of individual dark brown scales; hind coxa dark gray-brown with greenish sheen, with admixture of individual white scales anteriorly; hind femur externally dark gray-brown with bronzed sheen, with a narrow ocherous anterior margin, with a few dirty orange scales distally, and with white hair-like scales at posterior margin; hind tibia basally dark brown with green-purple sheen; dorsally mixed with orange, light brown-orange and white scales; exterior-ventrally dark brown with bronzed-green sheen, with two small white to pale yellow spots with golden hue medially and between bases of both pairs of spurs; interior-ventrally dark brown with purple sheen, with admixture of a few yellow-orange scales; spurs dark brown to black with bronzed-green sheen, exterior-apical spur mixed with white and light brown-orange scales internally; hind tarsus dark brown to black with bronzed-purple sheen, with a few white scales on basal tarsomere exterior-dorsally. Abdomen: dorsally dark brown to black with purple-blue sheen; tergites 1, 3 and 5 each densely covered with dirty orange-brown scales medially; 1, 2 and 3 with a narrow dirty yellow-orange stripe distally; tergites 4 and 7 each with admixture of individual dirty yellow-orange scales on distal margin; ventrally abdomen yellow-orange with golden hue with a few dark gray-brown to brown scales on basal sternite; anal tuft small, dark brown to black with bronzed-purple sheen with ocherous scales distally.

Forewing: costal margin, discal spot and veins within external transparent area dark brown to black with dark purple sheen; Cu-stem dark brown to black with dark purple sheen, with a narrow, short, white stripe posterior-basally; anal margin dark brown to black with dark purple sheen, with a few yellow and white scales basally; apical area dark brown to black with dark purple sheen with a few white scales between veins; discal spot relatively narrow with a short pointed projection proximally; transparent areas well-developed; external trans-



Figs 6–7. Male genitalia of *Melittia* spp. 6. *M. afonini* sp. nov., holotype (genital preparation No. GA-179). 7. *M. suzukii* sp. nov., holotype (genital preparation No. GA-195). (a: tegumen-uncus complex, b: valva, c: saccus, d: aedeagus). Scale bar: 0.5 mm.

parent area large, distinctly narrowed costally, divided into six cells, level to vein M_2 about five times as broad as discal spot and about four times broader than apical area; cilia dark gray-brown with purple-bronzed sheen. Hindwing: transparent; anal area opaque, dark brown with dark purple sheen, anally densely covered with yellow to pale yellow scales with golden hue; veins, discal spot and outer margin dark brown to black with dark purple sheen; discal spot very narrow; outer margin narrow, about four times as narrow as cilia; cilia dark gray-brown with purple sheen.

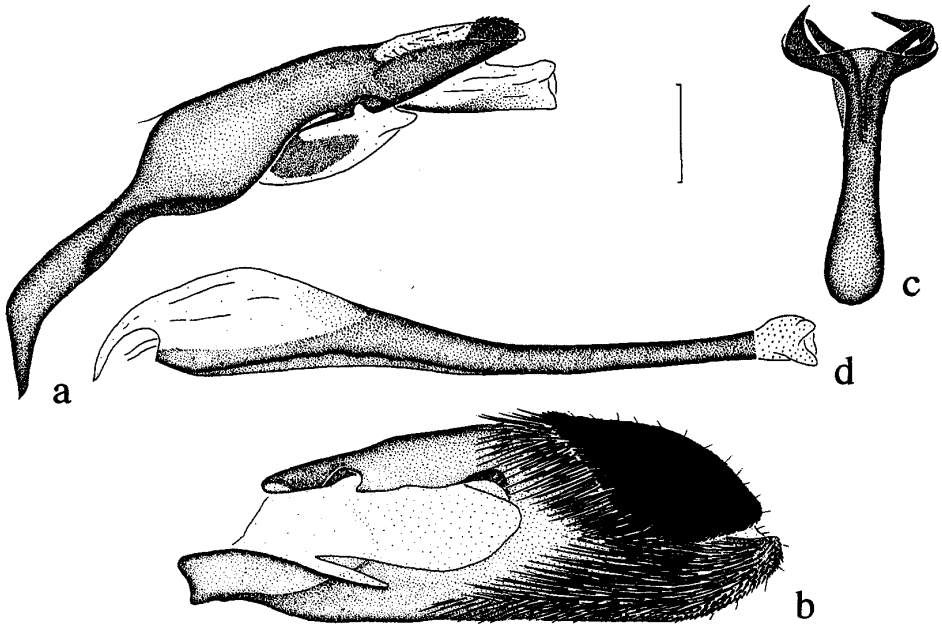


Fig. 8. Male genitalia of *Melittia nilgiriensis* sp. nov., paratype (genital preparation No. GA-197). (a: tegumen-uncus complex, b: valva, c: saccus, d: aedeagus). Scale bar: 0.5 mm.

Male genitalia (holotype, genital preparation No. GA-179) (Fig. 6a–d). Tegumen-uncus relatively narrow; uncus bilobed distally with a relatively small oval plate of strong, short, pointed setae internally on each side; gnathos rather large, membranous with a relatively broad, slightly sclerotized plate medio-basally (Fig. 6a); valva (Fig. 6b) trapeziform-oval, relatively narrow, slightly broadened distally; distal field of setae narrowly separated from medial one; setae of medial field relatively long, completely covering pocket-shaped crista; ventral lobe relatively narrow and short, clearly not exceeding distal margin of valva; pocket-shaped crista short but broad; saccus rather long and narrow, club-shaped, rounded basally (Fig. 6c); aedeagus (Fig. 6d) narrow, about as long as valva; vesica with numerous minute cornuti.

Female (paratype) (Fig. 2). Alar expanse 28.5 mm; body length 15.5 mm; forewing 12.2 mm; antenna 7.0 mm.

Nearly same as in the male, with some differences as follows. Head: dorsally black occipital fringe mixed with pale yellow scales. Thorax: metaepimeron and metameron posteriorly gray-brown with purple-bronzed sheen, with admixture of white scales, densely covered with white, long, hair-like scales masking background coloration. Legs: fore coxa with a narrow dark brown stripe instead of a rather broad stripe; mid tibia densely mixed with dark brown scales internally; externally with a few white scales with electric blue hue subbasally, with a small white spot with electric blue-purple hue medially and a small pale yellow spot somewhat basally of base of spurs exterior-ventrally; mid tarsus exterior-dorsally dark brown to black with purple-green sheen, with white scales at base of basal tarsomere and with a few yellow scales at base of second tarsomere; interior-ventrally midtarsus yellow to pale yellow, basal tarsomere orange with a few black scales; hind tarsus with three distal tarsomere yellow orange to orange dorsally. Abdomen: dorsally dark brown to black with dark purple sheen; tergites 3 and 5 each densely mixed with dirty yellow-orange scales proximally; each tergite with a narrow dirty yellow-orange, distal margin; ventrally abdomen pale yellow-orange with

golden sheen with a few dark gray-brown to brown scales on two basal sternites.

Forewing: Cu-stem with a narrow, short, pale yellow stripe posterior-basally; anal margin with yellow scales basally; external transparent area divided into five cells, level to vein M_2 about three times as broad as discal spot and about twice broader than apical area; cilia dark gray-brown with purple-bronzed sheen. Hindwing: anal area opaque, dark brown with bronzed-purple sheen.

Female genitalia (paratype, genital preparation No. GA-192) (Figs 10, 12). Papillae anales membranous with a small membranous plate basally, covered with short setae; 8th tergite relatively broad with relatively long setae at posterior margin ventrally and with a long seta at inner margin ventrally; posterior apophyses about as long as anterior apophyses; latter with a very short and narrow appendix ventrobasally; ostium bursae opening near posterior margin of 7th sternite, funnel-shaped, relatively broadly well sclerotized; antrum narrow, with well sclerotized posterior half and membranous anterior one (Fig. 12); ductus bursae membranous, narrow, long, about twice as long as anterior apophyses; corpus bursae ovoid to globose, membranous, with signum relatively large, broadly pyriform, with numerous transverse, well-sclerotized, dentate stripes, bifurcate and ringed around base of corpus bursae posteriorly (Fig. 12).

Individual variability. Unknown.

Seasonal variability. Unknown.

Differential diagnosis. Due to the conformation of both the male and female genitalia and coloration of the hind leg tuft this new species belongs to the *M. amboinensis* Felder, 1861 species-group. By the shape of the discal spot and external transparent area of the forewing it seems to be closest to *M. congruens* Swinhoe, 1890, *M. celebica* Le Cerf, 1916, *M. meeki* Le Cerf, 1916, *M. suzukii* sp. nov. and *M. bella* Arita & Gorbunov, 1996. From the first species compared (unfortunately, only one female is known for *M. congruens*), the female of *M. afonini* sp. nov. differs by the coloration of the hind tarsus (entirely dark brown to black in the species compared). From the second species compared, *M. afonini* sp. nov. can be separated by the coloration of the mid and hind coxa (both mid and hind coxa entirely white or with admixture of individual gray-brown scales with purple sheen in *M. celebica*), basal mid tarsomere (basal half entirely snow-white in the species compared), hind tibia (more bright orange, exterior-ventrally with two more large snow-white spots medially and between bases of both pairs of spurs in *M. celebica*) and by the coloration of the anal area of the hindwing (dark brown to black with bronzed sheen, densely covered with yellow hair-like scales and with a narrow white stripe with golden-blue hue at anal margin in the species compared). Besides this, these two species are easily distinguishable by the structure of the male (somewhat different shape of valva in *M. celebica*, *cp.* Fig. 6b with Fig. 49b in Arita & Gorbunov, 1996*b*) and, what is even more clear, by the female genitalia (antrum entirely membranous, signum semi-ringed around base of corpus bursae in the species compared, *cp.* Figs 10 and 12 and Figs 59 and 67 in Arita & Gorbunov, 1996*b*). From *M. meeki*, this new species differs by the coloration of the hind tibia (exterior-ventrally dark brown to black with green-purple sheen, with a few white scales with blue hue at midway between base of tibia and base of medial spurs, and with a small white spot between bases of both pairs of spurs in the species compared) and abdomen dorsally (tergites 1, 3, 5 and 7 each densely covered with dirty orange scales, masking background coloration and tergites 2, 4 and 6 each with admixture of dirty orange scales laterally and proximally in female and only tergites 3 and 5 each with admixture of dirty orange scales laterally and subproximally in male of *M.*

meeki), and by the conformation of the male (different shape of valva and pocket-shaped crista in *M. meeki*, *cp.* Fig. 6b with Fig. 52b in Arita & Gorbunov, 1996*b*) and female genitalia (ostium bursae ring-shaped, narrowly sclerotized; antrum entirely membranous, signum consisting entirely of numerous strong teeth, bifurcate and nearly ringed around base of corpus bursae in *M. meeki*, *cp.* Figs 10 and 12 with Figs 62 and 70 in Arita & Gorbunov, 1996*b*). From *M. suzukii* sp. nov., *M. afonini* sp. nov. can be distinguished by the coloration of the vertex (vertex dark brown to black without a small white spot between ocelli and without white scales slightly anteriorly of ocellus in the species compared), metaepimeron and metameron posteriorly (gray-brown with golden sheen, densely covered with yellow-orange, long, hair-like scales in *M suzukii* sp. nov.). Also, these two new species can be separated by minor details of coloration of various parts of the body (*cp.* the descriptions of these new species) and by the structure of both the male and female genitalia (see the corresponding figures herein). From *M. bella* (unfortunately, only females are known for this species), this new species differs by the coloration of the vertex (vertex black mixed with yellow and white hair-like scales but without a white spot or white scales at ocellus in the species compared), metaepimeron and metameron posteriorly (dark gray-brown with bronzed-purple sheen, densely covered with yellow-orange, long, hair-like scales in *M. bella*), mid tibia (black with green-violet sheen, with a large white spot with blue hue medio-externally in the species compared), hind tibia (more yellow in *M. bella*) and four apical hind tarsomeres (entirely black with green-violet sheen in *M. bella*). Besides this, these two species can be easily separated by the structure of the female genitalia, especially by the conformation of the antrum (entirely membranous in *M. bella, cp.* Figs 10 and 12 and Figs 14 and 16 in Arita & Gorbunov, 1996*a*). From other taxa of the *M. amboinensis* species-group, namely *M. nepcha* Moore, 1879, *M. dorsatiformis* Hampson, 1891, *M. javana* Le Cerf, 1916, *M. distincta* Le Cerf, 1916 (**stat. revalid.**) (not a synonym of *M. nepcha* Moore, 1879) and an undescribed species from Nepal, *M. afonini* sp. nov. is distinguishable by the shape of the external transparent area of the forewing (more broad and divided into six cells in all these species compared). Yet for a more correct determination of the species, it seems best of all to use the characters of the female genitalia, because the antrum of *M. afonini* sp. nov. is unique not only among members of the *M. amboinensis* species-group but also amongst all congeners of the Palearctic, Oriental and Australian dominions.

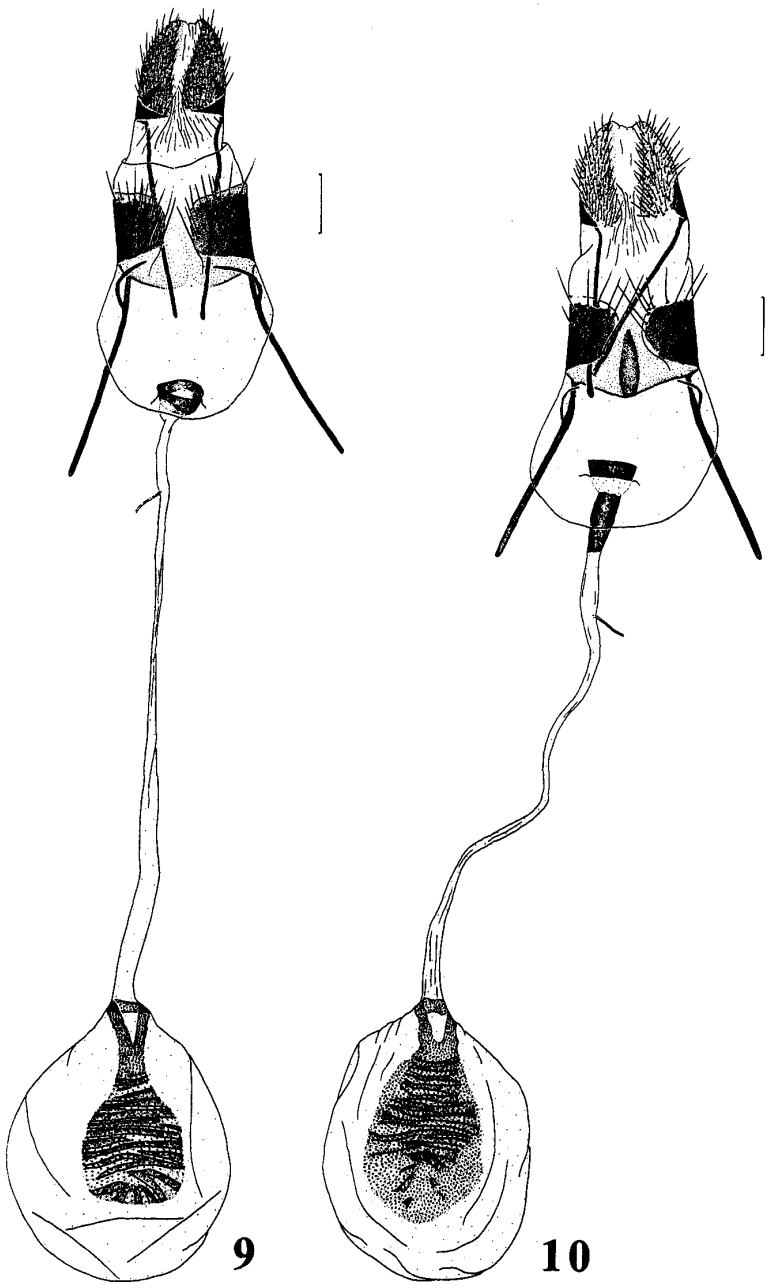
Bionomics. Specific host plant unknown, but most likely a species of the family Cucurbitaceae. The type series was collected from the end of July to the beginning of August by UV-light.

Habitat. The type series was netted at a border of tropical riparian forest.

Distribution. Known from the type locality in the state of Assam, India.

Material examined. 1 ♂ (holotype), NE India, Assam, Nameri Nat. Park, 60 km N of Tezpur, 150 m, 27°20′N, 93°15′E, 24. VII-2. VIII. 1997, Y. Afonin & V. Siniaev leg. (genital preparation No. GA-179) (COGM); 1 ♀ (paratype), same locality and date, Y. Afonin & V. Siniaev leg. (genital preparation No. GA-192) (COGM).

Etymology. We name this species after the late Yevgeny Ivanovich Afonin, died 19 November 1997, an amateur lepidopterologist (Moscow, Russia), who collected the type series of this new species in his last entomological expedition.

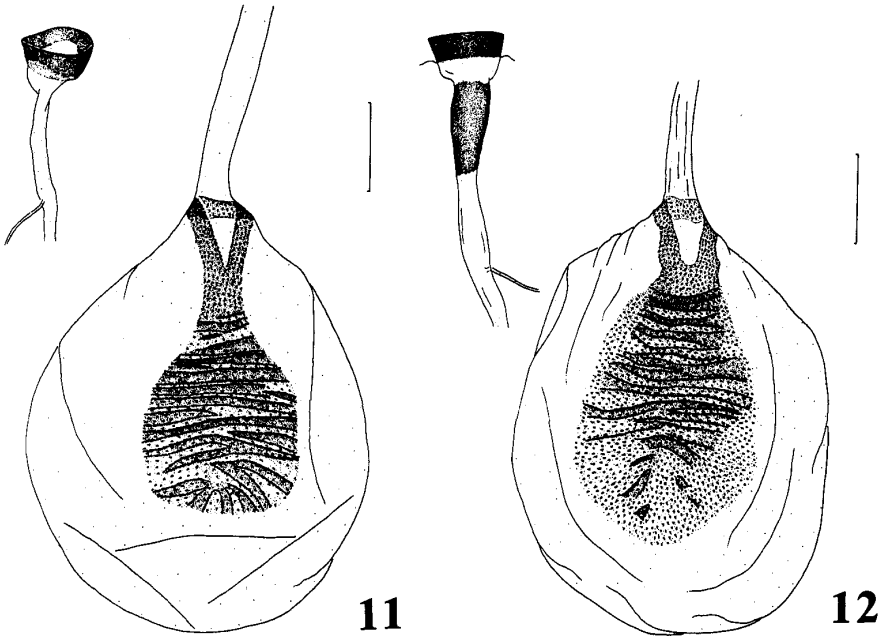


Figs 9–10. Female genitalia of *Melittia* spp. 9. *M. suzukii* sp. nov., paratype (genital preparation No. GA-194). 10. *M. afonini* sp. nov., paratype (genital preparation No. GA-192). Scale bar: 0.5 mm.

***Melittia suzukii* sp. nov.** (Figs 3–4, 7a–d, 9, 11)

Description. Male (holotype) (Fig. 3). Alar expanse 27.8 mm; body length 14.2 mm; forewing 12.0 mm; antenna 6.5 mm.

Head: antenna dorsally dark brown to black with dark purple sheen, with admixture of individual snow-white scales at anterior margin; ventrally light brown, densely mixed with yellow scales on distal quarter; scapus entirely dark gray-brown with bronzed sheen; frons dark gray-brown with bronzed-purple sheen, with a narrow white stripe laterally; basal joint



Figs 11-12. Ostium bursae, antrum and corpus bursae of female genitalia of *Melittia* spp. 11. *M. suzukii* sp. nov., paratype (genital preparation No. GA-194). 12. *M. afonini* sp. nov., paratype (genital preparation No. GA-192). Scale bar: 0.5 mm.

of labial palpus with a few black hair-like scales externally; mid joint dorsally dark gray-brown, ventrally white with two narrow dark brown to black stripes externally and internally; apical joint dark gray-brown with purple sheen, with a narrow white stripe ventrally; vertex dark brown to black with purple sheen mixed with pale yellow and white scales anteriorly; occipital fringe dorsally black with a few pale yellow setaceous scales, laterally entirely white. Thorax: patagium dark brown with bronzed-purple sheen, with a small white spot laterally; tegula dark brown to black with purple-bronzed sheen, with dirty yellow hair-like scales distally; mesothorax dark brown to black with bronzed-purple sheen, with a few dirty orange-yellow scales at distal margin; metathorax dark brown to black with bronzed-purple sheen, with a few dirty yellow scales laterally, and with a tuft of dirty yellow hair-like scales laterally; thorax laterally dark gray-brown with strong bronzed-purple sheen, with a few ocherous to whitish scales; posteriorly metaepimeron and metameron gray-brown with golden sheen, densely covered with yellow-orange, long, hair-like scales. Legs: neck plate white with a few dark brown to black scales medially; fore coxa white to ocherous with golden hue, with a few black hair-like scales basally and with a rather broad dark brown to black stripe with bronzed sheen externally, internally and distally; fore femur internally dark gray-brown with bronzed-green sheen, with admixture of individual white scales; externally dark brown to black with purple-bronzed sheen, densely mixed with white scales, with a few yellow scales distally; fore tibia ventrally yellow, dorsally dark brown with dark bronzed-green sheen with a few white scales medially; fore tarsus ventrally yellow to pale yellow, dorsally narrowly dark brown to black with dark purple sheen; mid coxa dark gray-brown with bronzed sheen, with a few ocherous scales anteriorly; mid femur internally ocherous; externally dark brown with bronzed-green sheen, with a narrow ocherous anterior margin and with admixture of white hair-like scales at posterior margin; mid tibia internally dark gray-brown with bronzed-green sheen; externally dark brown to black with bronzed-green sheen, with a small sparse spot of white scales with purple-blue hue medially; spurs dark brown with purple-green sheen; mid tarsus exterior-dorsally dark brown to black with

bronzed-purple sheen, with a large white spot at base on basal tarsomere; interior-ventrally yellow-orange with admixture of dark brown scales on distal four tarsomeres; hind coxa dark brown to black with bronzed-purple sheen; hind femur dark brown to black with bronzed sheen; hind tibia basally dark brown to black with green-bronzed sheen; exterior-dorsally mixed with light brown-orange and orange scales, with a small white to ocherous spot medially; exterior-ventrally mixed with dark brown to black with green-bronzed sheen and dirty orange scales, with two small yellow-orange spots medially and between bases of both pairs of spurs; dorsally covered with light brown-orange, orange and white scales; spurs dark brown to black with bronzed-green sheen; exterior-medial spur mixed with orange scales internally but exterior-apical spur mixed with white and light brown-orange scales internally; hind tarsus dark brown to black with green-bronzed sheen, with a few light brown-orange scales dorsally. Abdomen: dorsally dark brown to black with green-purple sheen; tergite 2 densely covered with light brown-orange setaceous scales; tergites 3 and 5 each mixed with dirty orange scales medially; tergites 2–4 each with a narrow yellow-orange stripe distally; tergite 7 with admixture of pale yellow scales at distal margin; ventrally abdomen dirty yellow-orange with golden hue with a few dark gray-brown to brown scales on two basal sternites; anal tuft small, dark brown to black with bronzed sheen with admixture of pale yellow scales ventrally.

Forewing: costal margin, discal spot and veins within external transparent area dark brown to black with dark purple sheen; Cu-stem dark brown to black with dark purple sheen, with a few white scales posterior-basally; anal margin dark brown to black with dark purple sheen, with a few dirty yellow scales posterior-basally; apical area dark brown to black with dark purple sheen with a few white scales between veins; discal spot narrow with a short pointed projection proximally; transparent areas well developed; external transparent area large, distinctly narrowed costally, divided into five cells, level to vein M_2 about three times as broad as discal spot and apical area; cilia dark gray-brown with purple-bronzed sheen. Hindwing: transparent; anal area opaque, dark brown to black with bronzed sheen, densely covered with orange yellow scales with golden hue; veins, discal spot and outer margin dark brown to black with dark purple sheen; discal spot very narrow; outer margin narrow, about four times as narrow as cilia; cilia dark gray-brown with purple sheen.

Male genitalia (holotype, genital preparation No. GA-195) (Fig. 7a–d). Tegumen-uncus relatively narrow; uncus bilobed distally with a relatively small semi-oval plate of strong, short, pointed setae internally on each side; gnathos rather large, membranous with a relatively broad, slightly sclerotized plate medio-basally (Fig. 7a); valva (Fig. 7b) trapeziform-oval, relatively narrow, clearly broadened distally; distal field of setae not separated from medial one; setae of medial field relatively short, nearly not covering pocket-shaped crista; ventral lobe relatively broad and long, slightly exceeding distal margin of valva; pocket-shaped crista long but narrow, with longitudinal costal and distal parts; saccus rather short and narrow, club-shaped, slightly flattened basally (Fig. 7c); aedeagus (Fig. 7d) narrow, slightly shorter than valva; vesica with numerous minute cornuti.

Female (paratype) (Fig. 4). Alar expanse 32.8 mm; body length 16.2 mm; forewing 13.9 mm; antenna 7.4 mm.

Nearly identical with the male, but some differences as follows. Head: dark brown to black antenna with dark green-purple sheen; scapus with a few white scales laterally; frons dark gray-brown with bronzed-purple sheen, with a narrow white stripe laterally; apical joint of labial palpus with a few yellow scales dorsally; vertex with a few pale yellow scales anteriorly. Thorax: metaepimeron and metameron covered with yellow-orange, long, hair-like scales,

masking background coloration. Legs: fore coxa with a broad dark brown to black stripe with bronzed sheen externally; mid tarsus interior-ventrally yellow-orange; basal tarsomere exterior-dorsally dark brown to black with purple-green sheen, with a large white to pale yellow spot basally and with admixture of light brown-orange scales dorso-medially; remaining tarsomeres exterior-dorsally dark brown to black with green-bronzed sheen, with admixture of a few yellow scales basally; hind tarsus dark brown to black with green-bronzed sheen, with a few light brown-orange scales dorsally on basal tarsomere and with admixture of yellow scales on three distal tarsomeres exterior-dorsally. Abdomen: dorsally dark brown to black with dark purple sheen; tergites 1–3 each densely covered with light brown-orange scales; tergite 5 with admixture of dirty yellow scales; tergites 2–6 each with a narrow pale orange stripe distally.

Forewing: costal margin dark brown to black with dark purple sheen, with a narrow pale orange stripe between vein Sc and R-stem; anal margin dark brown to black with dark purple sheen, with admixture of light brown-orange scales on basal half and with a few dirty yellow scales with golden hue posterior-basally; external transparent area large, about thrice as broad as discal spot and about twice as broad as apical area.

Female genitalia (paratype, genital preparation No. GA-194) (Figs 9, 11). Papillae anales membranous with a small membranous plate basally, covered with short setae; 8th tergite relatively broad with relatively short and long setae at posterior margin ventrally and with 2–3 long setae at inner margin ventrally; posterior apophyses about as long as anterior apophyses; latter with a long and narrow appendix ventrobasally; ostium bursae opening near posterior margin of 7th sternite, funnel-shaped, relatively broadly well sclerotized; antrum narrow, membranous (Fig. 11); ductus bursae membranous, narrow, long, about thrice as long as anterior apophyses; corpus bursae globose, membranous, with signum relatively large, broadly pyriform, with numerous transverse, well sclerotized, dentate stripes, bifurcate and ringed around base of corpus bursae posteriorly (Fig. 11).

Individual variability. Unknown.

Seasonal variability. Unknown.

Differential diagnosis. With the previous species, *M. suzukii* sp. nov. belongs to the *M. amboinensis* Felder, 1861 species-group and it seems to be closest to *M. congruens* Swinhoe, 1890, *M. bella* Arita & Gorbunov, 1996, *M. celebica* Le Cerf, 1916, *M. meeki* Le Cerf, 1916 and *M. afonini* sp. nov. From the first species compared (unfortunately, only one female is known for this species), the female of *M. suzukii* sp. nov. differs by the coloration of the mid tibia (with brown and golden-yellow scales basally in *M. congruens*) and hind tarsus (entirely dark brown to black in the species compared). From *M. bella* (unfortunately, only females are known for this species), this new species is separable by the relatively larger size (alar expanse 27.6–28.2 mm in the females of the species compared) and by the coloration of the hind tarsus (basal tarsomere with less numerous light brown-orange scales, four distal tarsomeres entirely black with green-violet sheen in *M. bella*). Besides this, these two species can be distinguished by the structure of the female genitalia (papillae anales more narrow, ductus bursae less than twice as short as epiphyses anterior in *M. bella*, *cp.* Fig. 9 with Fig. 14 in Arita & Gorbunov, 1996*a*). From the third species compared, *M. suzukii* sp. nov. can be distinguished by the coloration of the mid and hind coxa (both mid and hind coxa entirely white or with admixture of individual gray-brown scales with purple sheen in *M. celebica*), basal mid tarsomere (basal half entirely snow-white in the species compared), hind tibia (more bright orange, exterior-ventrally with two more large snow-white spots medially and

between bases of both pairs of spurs in *M. celebica*), anal area of the hindwing (dark brown to black with bronzed sheen, densely covered with yellow hair-like scales and with a narrow white stripe with golden-blue hue at anal margin in *M. celebica*) and by the conformation of the male (somewhat different shape of pocket-shaped crista and ventral lobe of valva in *M. celebica*, *cp.* Fig. 7b with Fig. 49b in Arita & Gorbunov, 1996*b*) and female genitalia (signum semi-ringed around base of corpus bursae in the species compared, *cp.* Figs 9 and 11 and Figs 59 and 67 in Arita & Gorbunov, 1996*b*). From *M. meeki*, *M. suzukii* sp. nov. is distinguishable by the coloration of the hind tibia (exterior-ventrally dark brown to black with green-purple sheen, with a few white scales with blue hue at midway between base of tibia and base of medial spurs, and with a small white spot between bases of both pairs of spurs in *M. meeki*), abdomen dorsally (tergites 1, 3, 5 and 7 each densely covered with dirty orange scales, masking background coloration and tergites 2, 4 and 6 each with admixture of dirty orange scales laterally and proximally in female and only tergites 3 and 5 each with admixture of dirty orange scales laterally and subproximally in male of the species compared) and by the structure of the male (somewhat different shape of gnathos and different shape of valva and pocket-shaped crista in *M. meeki*, *cp.* Fig. 7b with Fig. 52b in Arita & Gorbunov, 1996*b*) and female genitalia (ostium bursae ring-shaped, narrowly sclerotized; signum consisting entirely of numerous strong teeth, bifurcate and nearly ringed around base of corpus bursae in *M. meeki*, *cp.* Figs 9 and 11 with Figs 62 and 70 in Arita & Gorbunov, 1996*b*). From *M. afonini* sp. nov., *M. suzukii* sp. nov. can be separated by the coloration of the vertex (dark brown to black with purple sheen, with a small white spot between ocelli and with a few white scales slightly anteriorly of ocellus, densely covered with hair-like black, white and pale yellow scales in *M. afonini* sp. nov.), metaepimeron and metameron posteriorly (gray-brown with purple-bronzed sheen, with admixture of white scales, densely covered with white, long, hair-like scales, masking background coloration in the species compared). Also, these two new species can be separated by minor details of coloration of various parts of the body (*cp.* the descriptions of these new species above) and by the structure of both the male and female genitalia (see the corresponding figures herein). From other taxa of the *M. amboinensis* species-group, *M. afonini* sp. nov. is distinguishable by the shape of the external transparent area of the forewing (more broad and divided into six cells in all these species compared).

Bionomics. The specific host plant is unknown. The type series has been collected at an altitude of about 800 m in the mid of September.

Habitat. A border of tropical forest.

Distribution. Known only from the type locality in the state of Tamil Nadu, India.

Material examined. 1 ♂ (holotype), India, Tamil Nadu, Nilgiris, Lower Nadugani, *ca* 800 m, 14. IX. 1998, T. Suzuki leg. (genital preparation No. GA-195) (ZMUN); 1 ♀ (paratype), same locality and date, T. Suzuki leg. (genital preparation No. GA-194) (ZMUN).

Etymology. This new species is named after T. Suzuki, an insect photographer (Koshigaya-shi, Saitama-ken, Japan), who collected the type series of the new species.

***Melittia nilgiriensis* sp. nov.** (Figs 5, 8a–d)

Description. Male (holotype) (Fig. 5). Alar expanse 29.5 mm; body length 15.3 mm; forewing 13.0 mm; antenna 7.1 mm.

Head: antenna dorsally black with dark purple-green sheen, with a few snow-white scales at anterior margin; ventrally dark brown to black with admixture of yellow scales both apically

and basally; scapus dark gray-brown with pale yellow to yellow scales ventrally; frons dark gray-brown with purple-bronzed sheen, with a narrow pale yellow stripe laterally; basal joint of labial palpus yellow to pale yellow; medial and apical joint dorsally dark brown to black mixed with yellow, ventrally yellow with admixture of black scales; vertex dark brown to black with purple sheen, mixed with dirty yellow scales anteriorly, with a small yellow spot anteriorly of ocellus; occipital fringe dorsally dirty olive-brown, laterally pale yellow. Thorax: patagium dark brown to black with purple sheen, densely covered with dirty brown-olive scales, masking background coloration, with a small pale yellow spot laterally; tegula dark brown to black with bronzed-purple sheen, densely covered with dirty brown-olive scales, masking background coloration; mesothorax dark brown to black with bronzed-purple sheen, densely covered with dirty brown-olive scales, masking background coloration, with a few dirty yellow scales medially at distal margin; metathorax dark brown to black with bronzed-purple sheen, with a tuft of dirty yellow and dark brown hairs laterally; laterally thorax dark gray-brown with strong green-purple sheen, with admixture of individual pale yellow and ochreous scales; posteriorly metaepimeron and metameron dark brown to black with bronzed sheen, densely covered with dark brown, long, hair-like scales. Legs: neck plate entirely pale yellow with golden hue; fore coxa dark gray-brown with bronzed sheen, densely covered with pale yellow and white scales, with a few black hair-like scales basally; fore femur dark brown to black with bronzed sheen, densely mixed with yellow to pale yellow scales; fore tibia yellow ventrally, dorsally dark brown to black with purple sheen, with admixture of individual yellow scales; fore tarsus yellow to pale yellow with a narrow dark brown to black stripe with green-purple sheen dorsally; mid coxa pale yellow with golden hue, with a few dark gray-brown scales; mid femur internally pale yellow, externally dark gray-brown with bronzed sheen, with a narrow pale yellow anterior margin, with admixture of yellow hair-like scales on posterior margin and with a few dirty yellow scales distally; mid tibia dark brown to black with bronzed sheen, externally densely mixed with dirty light brown and yellow scales with a small white spot with blue-violet hue medially; spurs dark brown to black with bronzed sheen; mid tarsus entirely dark brown to black with green-bronzed sheen, with a narrow white ring at base of first tarsomere and with a few white scales dorso-basally on second tarsomere; hind coxa anteriorly white with golden-purple hue, posteriorly dark brown to black with green-purple sheen; hind femur dark brown to black with bronzed sheen, with a narrow pale yellow stripe at anterior margin; hind tibia basally narrowly dark brown to black with bronzed-violet sheen; exterior-dorsally dirty light brown with a small white spot with blue-violet hue medially; exterior-ventrally dark brown to black with greenish sheen, with a large white spot between base of tibia and base of mid spurs and with a small yellow spot somewhat distally of base of mid spurs; dorso-internally covered with yellow and a few dark brown scales, and with a few light brown, pointed scales distally; spurs dark brown to black with bronzed-purple sheen; both exterior spurs with yellow scales internally; hind tarsus entirely dark brown to black with purple-green sheen. Abdomen: dorsally dark brown-black with dark purple-green sheen; tergite 2 densely covered with narrow, setaceous, dirty brown-orange scales; all tergites with yellow distal margin; ventrally sternites 1+2 and 3 each dark brown to black with bronzed sheen; remaining sternites ocherous with golden hue; anal tuft small, dark brown to black with purple sheen, mixed with white scales ventrally.

Forewing: costal margin and veins within external transparent area dark brown to black with dark purple sheen; Cu-stem dark brown to black with dark purple sheen, with a narrow, short, dark yellow stripe posterior-basally; anal margin dark brown to black with dark purple sheen, with admixture of yellow and dirty brown-olive scales at base posteriorly;

discal spot dark brown to black with dark purple sheen, with a few light brown scales at margins; apical area dark brown to black with dark purple sheen, with a few light brown and snow-white scales between veins; discal spot relatively broad, with long narrow projection proximally, dividing anterior transparent area into two cells; transparent areas well developed; external transparent area rather small, divided into five cells, level to vein M_2 about 1.5 times as broad as discal spot (without proximal projection) and about as broad as apical area; cilia gray-brown with bronzed-purple sheen. Hindwing: transparent; anal area opaque, dark brown to black with bronzed sheen, anally densely covered with pale yellow to yellow scales with golden-green hue; veins, discal spot and outer margin dark brown to black with dark purple sheen; discal spot extremely narrow; outer margin narrow, about thrice as narrow as cilia; cilia gray-brown with bronzed-purple sheen.

Male genitalia (paratype, genital preparation No. GA-197) (Fig. 8a–d). Tegumen-uncus relatively narrow; uncus bilobed distally with a relatively small semi-oval plate of strong, short, pointed setae internally on each side; gnathos rather small, membranous with a relatively small, oval, slightly sclerotized plate medio-basally (Fig. 8a); valva (Fig. 8b) trapeziform-oval, relatively narrow; distal field of setae not separated from medial one; setae of medial field relatively short, not covering pocket-shaped crista; ventral lobe relatively broad and long, slightly exceeding distal margin of valva; pocket-shaped crista short and narrow; saccus rather long and narrow, club-shaped, rounded basally (Fig. 8c); aedeagus (Fig. 8d) relatively broad, long, about as long as valva; vesica with numerous minute cornuti.

Female. Unknown.

Individual variability. The second specimen (paratype) of this new species has somewhat more dirty yellow scales on the vertex anteriorly and pale yellow scales on the fore coxa only, but it is slightly larger than the holotype: alar expanse 30.2 mm; body length 16.2 mm; forewing 12.8 mm; antenna 7.1 mm.

Seasonal variability. Unknown.

Differential diagnosis. This new species seems to be closest to *M. siamica* Walker, [1865], *M. sumatrana* Le Cerf, 1916, *M. gorochovi* Gorbunov, 1988, *M. newara* Moore, 1879, *M. indica* Butler, 1874. From the first species compared, *M. nilgiriensis* sp. nov. can be distinguished by the relatively larger size (alar expanse 26.0 mm in the holotype of *M. siamica*), by the shape and size of the discal spot (with somewhat shorter proximal projection in *M. siamica*) and external transparent area of the forewing (narrowed costally, level to vein M_2 about twice as broad as discal spot and slightly broader than apical area in *M. siamica*, *cp.* Fig. 5 with Fig. 9 in Arita & Gorbunov, 1995*b*), by the coloration of the anal area of the hindwing (dark brown mixed with pale yellow, whitish and yellow scales in the species compared) and by the structure of the male genitalia (somewhat different shape of valva, pocket-shaped crista and ventral lobe of valva in *M. siamica*, *cp.* Fig. 8b with Fig. 18b in Arita & Gorbunov, 1995*b*). From the second species compared, this new species differs by the shape and size of the discal spot (with somewhat shorter proximal projection in *M. sumatrana*) and external transparent area of the forewing (more broad, level to vein M_2 about thrice as broad as discal spot and about 2.5 times as broad as apical area in male of *M. sumatrana*, *cp.* Fig. 5 with Fig. 47a in Arita & Gorbunov, 1996*b*), by the coloration of the fore coxa (pale yellow to yellow with a few dark brown scales exterior-distally in the species compared), hind tibia (with admixture of light brown-orange scales in *M. sumatrana*) and hind tarsus (dark brown to black with green-purple sheen, with a few light brown-orange scales dorsally at base in the species compared) and anal area of the hindwing (dark brown,

densely covered with dirty yellow and a few rusty scales in *M. sumatrana*). Besides that, these two species have some differences in the male genitalia (*cp.* Fig. 8 and Fig. 54 in Arita & Gorbunov, 1996*b*). From the next two species compared, *M. nilgiriensis* sp. nov. is clearly separable by the shape and size of the discal spot and external transparent area of the forewing (discal spot with more short proximal projection and external transparent area more broad in these both species compared), by the coloration of the metaepimeron and metameron posteriorly (with white, long, hair-like scales in these species compared) and by the structure of the male genitalia (*cp.* Fig. 8 with Figs 9–10 in Gorbunov & Arita, 1996). From *M. indica*, *M. nilgiriensis* sp. nov. is also distinguished by the shape and size of the discal spot and external transparent area of the forewing (proximal projection of discal spot shorter and external transparent area more broad in *M. indica*). Besides this, *M. indica* has the hind leg tuft darker and a few pale yellow scales with strong electric light green-blue hue on the anal area of the hindwing.

Bionomics. The host plant is unknown. The type series has been collected at an altitude of about 800 m in the mid of September.

Habitat. A border of tropical forest.

Distribution. Known only from the type locality in the state of Tamil Nadu, India.

Material examined. 1 ♂ (holotype), India, Tamil Nadu, Nilgiris, Lower Nadugani, *ca* 800 m, 14. IX. 1998, T. Suzuki leg. (ZMUN); 1 ♂ (paratype), same locality and date, T. Suzuki leg. (genital preparation No. GA-197) (ZMUN).

Etymology. The name of this new species is derived from the Nilgiri Hills, South India, a very famous collecting site from the last century.

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摘　　要

インド産モモブトスカシバ属 (鱗翅目，スカシバガ科) の 3 新種 (Oleg G. Gorbunov•有田　豊)

我々の友人によってインドで採集されたスカシバガ科のモモブトスカシバ属の 4 種を報告した．1 種は東洋区に広く分布している *Melittia eurytion* (Westwood, 1848) で他の 3 種は新種であったので記載し，図示した．

1. *Melittia eurytion* (Westwood, 1848)

東洋区に広く分布しており，かつ良く知られている種類である．今回記録した 21 頭は全て夜間に紫外線ランプに飛来した個体である．

2. *Melittia afonini* sp. nov. (Figs 1-2, 6a-d, 10, 12)

インドのアッサムで得られた 1 ♂と 1 ♀が知られるのみである．本新種は *amboinensis* グループで，*M. congruens* Swinhoe, 1890, *M. celebica* Le Cerf, 1916, *M. meeki* Le Cerf, 1916, *M. bella* Arita & Gorbunov, 1996 および次種の *M. suzukii* sp. nov. に非常に良く似ている．前，中，後脚の腿節や脛節などの色彩の違いで区別される．雌雄ゲニタリアも異なる．

3. *Melittia suzukii* sp. nov. (Figs 3-4, 7a-d, 9, 11)

インドのニルギリで得られた 1 ♂と 1 ♀で記載した．前種同様 *amboiensis* グループに所属し，前種のところで記したとおり近似種から区別される．

4. *Melittia nilgiriensis* sp. nov. (Figs 5, 8a-d)

前種と同じニルギリで得られた 2 ♂を新種で記載した．本新種は *M. siamica* Walker, [1865], *M. sumatrana* Le Cerf, 1916, *M. gorochovi* Gorbunov, 1988, *M. newara* Moore, 1879, *M. indica* Butler, 1874 などに酷似しているが，前翅横脈紋の形状，中室外方透明紋，後脚長毛の色彩などの相異で区別される．♂ゲニタリアも異なる．

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